

REMARKS

This response is filed in response to the non-final Office action dated March 31, 2004. All objections and rejections are respectfully traversed. Reconsideration of the application, as amended, is respectfully requested.

Claims 1-40 are pending. Applicants have added new claims 36-40 which comprise the same or similar subject matter as originally presented claims 1-35. No new matter is being introduced.

Claims 1, 3, 14, 16, 26 and 28 have been amended to better claim the invention. In particular, independent claims 1, 14 and 26 were amended only to clarify wording and not to avoid cited art.

At paragraphs 1-2 in the Office action, claims 1-2, 14-15 and 26-27 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,664,187 to Burkes et al. (hereinafter "Burkes").

The present invention, as set forth in representative independent claim 1, comprises in part:

A method for managing a time-limited long-running process carried out upon an array of disks, the method comprising the steps of:

establishing a registry having a plurality of entries, each entry corresponding to one of a plurality of groups of disks in the array of disks, each entry having a value indicative of a respective time at which its corresponding group of disks was last acted-upon by the long-running process; and

performing the long-running process on each of the groups of disks based upon an order in which the group having an oldest last acted-upon

time is processed first and the group having the newest last acted-upon time is processed last.

Burkes teaches partitioning a physical storage space of an array of disks into multiple virtual data blocks and associating each virtual data block with either a mirror RAID storage area (RAID Level 1) or a parity RAID storage area (RAID Level 5). See, for example, the Abstract in Burkes. Individual data blocks are “migrated” between the mirror and parity RAID areas so their contained data undergoes a change in redundancy from RAID Level 1 to RAID Level 5. See Col. 2, lines 6-9.

In a “less preferred” embodiment in Burkes, each individual data block is time stamped based on when its contained data was written therein. The data blocks are sorted based upon their relative time-stamp values and then migrated in order from oldest to youngest. See Col. 10, lines 61-67. Alternatively, Burkes teaches a preferred embodiment where a frequency distribution table is used to identify a range of time-stamp values which may be migrated, then data blocks having time stamps within the identified range are migrated from RAID Level 1 to RAID Level 5. See Col. 11, lines 7-25 and Col. 13, lines 34-46.

The Applicants respectfully urge that Burkes does not teach or other disclose *establishing a registry having a plurality of entries, each entry corresponding to one of a plurality of groups of disks in the array of disks, each entry having a value indicative of a respective time at which its corresponding group of disks was last acted-upon by the long-running process*, as recited in Applicants’ claim 1.

First, Burkes time stamps individual data blocks stored in an array of disks, whereas the Applicants' claim 1 time stamps a group of disks and not the individual data blocks stored on those disks. Specifically, each data block in Burkes is assigned a time-stamp value based on when data was written to the data block. See Burkes at Col. 10, lines 48-50. On the other hand, the Applicants' claim 1 associates a time-stamp value, i.e., "a value indicative of a respective time," with a corresponding group of disks to indicate when the group of disks was last acted upon by a long-running process. Clearly, Burkes and Applicants' claim 1 associate time stamps with different units of storage: individual data blocks (Burkes) versus a group of disks (claim 1).

Second, because the time stamps in Burkes denote when data was written to individual data blocks, Burkes's time stamps are not indicative of when a group of disks was last acted-upon by a long-running process, as explicitly recited in Applicants' claim 1.

Third, Burkes does not establish a registry having a plurality of entries, "each entry having a value indicative of a respective time at which its corresponding group of disks was last acted-upon by the long-running process," as claimed. Instead, Burkes maintains frequency distribution tables that statistically characterize the data blocks in terms of their time-stamp values. See Burkes at Col. 11, lines 9-12. In other words, Burkes's frequency distribution tables store statistical information associated with time-stamped data blocks and do not store the data blocks themselves as table (or registry) entries. Consequently, the frequency distribution tables in Burkes fail to establish a registry having a plurality of entries as recited in Applicants' claim 1.

Further, the Examiner asserts that the claimed invention is disclosed by Burkes at Col. 10, line 46 to Col. 11, line 2 and at Col. 13, lines 34-46. As noted above, Burkes describes migrating data blocks. Applicants respectfully note that Burkes is entirely silent concerning the Applicants' claimed *registry having a plurality of entries, each entry corresponding to one of a plurality of groups of disks in the array of disks, each entry having a value indicative of a respective time at which its corresponding group of disks was last acted-upon by the long-running process*. Moreover, because Burkes associates time stamps with individual data blocks rather than with groups of disks, the time stamps in Burkes cannot be indicative of a time at which a group of disks was last acted-upon by a long running process, as recited in Applicants' claim 1.

For the foregoing reasons, Applicants respectfully submit that Burkes is legally precluded from anticipating the Applicants' independent claim 1 under 35 U.S.C. §102 because of the total absence from Burkes of *a registry having a plurality of entries, each entry corresponding to one of a plurality of groups of disks in the array of disks, each entry having a value indicative of a respective time at which its corresponding group of disks was last acted-upon by the long-running process*.

Applicants respectfully submit that independent claims 14, 26 and 36-40 comprise the same or similar patentable subject matter as Applicants' independent claim 1, and are therefore allowable for the same reasons noted above. Applicants further submit that claims 2, 15 and 27 depend on independent claims 1, 14 and 26 and are allowable for at least the same reasons.

At paragraph 3 in the Office action, claims 32-35 were allowed. The Applicants thank the Examiner for expeditious allowance of these claims.

At paragraph 4 in the Office action, claims 3-13, 16-25 and 28-31 were objected to as being dependent on a rejected base claim. In response, claims 3, 16 and 28 have been rewritten in independent form so as to include all limitations of their preceding claims. Accordingly, the Applicants respectfully submit that claims 3-13, 16-25 and 28-31, in their present form, are in condition for allowance.

Accordingly, the Applicants submit that all pending claims are believed to be in condition for allowance, and early favorable action is respectfully requested.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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